

Mechanisms and Resources of Virtual Enterprise Risk Management

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Abstract. The article describe the risks of virtual enterprises, internal and external factors their and reasons. The typical risks are economical and organizational risks, the virtual enterprise can manage them with strategy policy methods. A virtual enterprise must constantly introduce new information technologies, protect information and explore marketing methods. The article provides recommendations for reducing innovative and financial risks of a virtual enterprise. The main risks are the entrepreneurial and informational; the virtual entrepreneur can make his decision to eliminate risks using the mechanisms described in the article. The main resources enabling an entrepreneur to manage the risks of a virtual enterprise are the enterprise website, the enterprise information system that automates business processes and marketing tools. The new approach is the application of volatility assessment for virtual markets of goods and services, which helps the entrepreneur to adjust the range his goods and services. The threats to a virtual enterprise when passing consumer payments are considered, as well as global risks associated with the lack of geographical boundaries on the Internet.

1. Introduction

The property of uncertainty inherent in innovation activity creates risks that are an integral element of entrepreneurship. The external environment has a number of factors affecting entrepreneurship; these primarily include the economic environment, the results of scientific and technological progress, politics and the legal field, socio-cultural, demographic and natural factors. Together with internal factors, such as the structure of a small enterprise, production technology and personnel, external factors generate risks and are subject to partial or full control by the entrepreneur. Self-management of entrepreneurship is carried out by the interaction of external and internal environment in the presence of property rights to the means of production, its products and income; the availability of a choice of the form of management and source of financing, planning, access to resources and management methods.

For virtual enterprises, external factors are network technologies and externalities that can arise and directly affect the results of an enterprise without the knowledge of the entrepreneur, which is impossible in the case of traditional enterprises. The peculiarity of virtual enterprises is their openness as an economic system, functioning in the computer network the Internet makes them part of this network, generates joint production of goods and services by an enterprise and a consumer.

The problem of managing the risks of virtual enterprises remains insufficiently studied. The works of C. Hanning, Z. Yunlong, H. Kunuyuan and L. Xunui [1] consider the application of artificial intelligence methods to risk management and build a two-level optimization model for financial risks, but

for small virtual enterprises this approach is quite complex, it requires implementation in software. N. Wang explores the risk control of a virtual enterprise with optimization model that shows how to identify and control the external risks of virtual enterprises whose sources are Internet markets [2]. L. Fuqiang, B. Hualing, M. Huang and W. Xingwei explore the risk management of virtual enterprises based on asymmetric information [3]. The listed articles and other studies relate to individual aspects of the risks of virtual enterprises, the problem is the lack of systematization of risks and practical proposals for small virtual businesses to prevent and eliminate them. The monograph [4] describes the types of risks for virtual enterprises, but there is not enough simple algorithm for the actions of an entrepreneur in the Internet. In [5] authors examine systemic external risks include the policy influence, social economic risk, industry risk and intellectual property, intermediate variable risks include the market risk and the entrepreneurs, they create the model but without mathematical evaluation.

To manage risks, it is necessary to develop mechanisms and identify their resources, to make informed recommendations based on mathematical methods.

2. Typical risks of virtual enterprises

2.1. Economic risks

The presence of risk in entrepreneurial activity in the form of the insecurity of adverse actions requires responsible management decisions for all types of enterprises. These decisions based on the use of the research, technological and strategic components of the innovation potential that the enterprise has.

Table 1. Classification of risks and their optimization at the stages of management.

Stages of management decision making	Typical organizational and economic risks at the stages of decision making	Risk management methods
Risk identification, problem statement	The risk of incorrect identification, resource and production and economic risks, the risk of untapped opportunities	Developing an organization's decision-making process and policies
Problem analysis, information gathering	Informational, methodical, property and marketing risks	Attracting external experts, developing your own method of analyzing the problem and collecting information.
Developing alternatives	The risk of unused opportunities, the risk of inertia, the risk of creativity, consistency and follower	Formation of several mutually exclusive alternatives, collective development of alternatives for strategic decisions, development and improvement of managers' skills
Optimization	The risk of inconsistency of alternatives, identification and accounting of existing restrictions, the risk of rationality and reasonableness	Identification and impact on flexible constraints, alignment of the alternative with the goals and mission of the enterprise, development of methods and procedures for justifying decisions
Implementing a management decision	The risk of resistance from the performers, the risk of insecurity of the implementation of the decision	Attracting executives to the decision-making process, taking into account the interests of executive employees, explaining to the executives the need to implement the decision: monitoring; pricing regulation; personnel management.

Solutions are supported by a set of measures to limit all types of risks, including the innovative risks of virtual enterprises, whose livelihoods require constant technological updates of hardware and software.

The most important step in minimizing economic risk in an enterprise is to make the right management decision. The Table 1 presents the classification of risks at the stages of making management decisions and methods for their optimization.

To minimize the risks of innovation of virtual enterprises, which accompanies the enterprise throughout its life cycle and constitutes the essence of its activities, the following measures are necessary. The research component should contain such activities as constant tracking of new information technologies that accelerate the search for information on the Internet and speed up the work of the computers themselves; allow the use of new means of communication with the consumer, such as mobile communications; use of social networks to promote products and services.

Technological components include follows. First, the information protection, ensuring the safety of the enterprise. Second, the development of new forms and types of the site (showcases of the enterprise). Third, the means of communication with consumers in the form of direct and reverse postal and other electronic communications. Forth, the preventive maintenance of all involved equipment. Fifth, the duplication of data and sixth, the creation of a daily history of the company with further analysis to adjust the strategy and tactics. The strategic component depends on reduced demand, market entry errors, and the impossibility of creating competitive advantages, pricing errors and competitors' actions.

The stages of managing the innovative risks of virtual enterprises are in Table 2.

Table 2. Management of innovative risks of virtual enterprises.

Stage content	Management actions
1. Defining an overall risk management strategy for a virtual enterprise	Determination of acceptable for the enterprise level of risk, measures for its optimization
2. Selection of an innovative project	Determination of compliance with the needs and demands of consumers
3. Collection and processing of information on external and internal innovation risk factors	Identification and ranking of factors and sources of risk
4. Evaluation of an innovative project	Determination of evaluation method
5. Risk level analysis	Determination of critical values of risk for the enterprise based on a scale of expert and calculated estimates
6. Decision on the implementation of an innovative project (development and installation of new equipment and software)	Selection of external risk reduction tools (change of provider, service provider, antivirus software) and development of internal risk reduction tools
7. Deciding on the implementation of an innovative project	Determination of the adjusted risk level by its main types
8. Monitoring and evaluation of the results of innovation risk management in a virtual enterprise	Development of recommendations for improving risk management

2.2. Virtual enterprise risk management strategy

A virtual enterprise must have a risk management strategy when making investment decisions. The following methods exist to form this strategy: analytical, information-logistic, expert, alternative and

multi-variant. The real investments in the production process, compared with the financial investments invested in the company's securities, have the following advantages. First, the absence of additional costs for the payment of commissions to brokerage firms. Second, insurance premiums to accounts of clearing houses of stock exchanges. Third, less dependence on temporary drops in the global economic system. Forth, wide margin for maneuver in the dividend policy. This means that a virtual trading enterprise must make investments in expanding the product range, developing (acquiring) tools for analyzing the market and consumer behavior, updating the site and computer tools, also in information security of the enterprise. For example, in the 10-point risk assessment of a virtual enterprise these estimates use, among other things, for investment risk when developing a risk mitigation strategy: the higher the points for expert assessment of investment risks, the higher the likelihood of risks. If the ratio less than five investment processes can be activated.

When minimizing organizational and economic risks, the main activity is the constant monitoring of all forms of reporting, the presentation of analysis results in various forms, tabular and graphical. This monitoring is carried out both within the virtual enterprise and the external market environment, since the Internet can quickly receive information about the actions of competitors, the prices of their goods and services and securities listed on the stock exchange. In this case, the following strategies and tactics are possible.

In the event of a deterioration in the financial condition of the company, first it is necessary to conduct a thorough analysis of the financial statements and search for losses, overdue debts. Second, in case of growth of inventories - find out their reasons and conduct an internal financial analysis. Forth, develop a program to reduce costs, reduce receivables. Fifth, control outsource. Sixth, to look for additional sources of financing, including by changing financial policies and providing loans to customers when selling goods and services.

Minimizing the risk of reducing profits and losing money is to regularly check the accounting and statistical reporting, control new regulatory documents, plan expenses and create a reserve fund for force majeure circumstances.

The avoidance of financial and economic risks, including the loss of money when a deal is concluded, consists in insurance, risk sharing among partners, attraction of venture capital to the project.

2.3. Business risks

When managing the business risks of virtual enterprises, one should adhere to the following principles: one should not risk more than his own capital allows; the consequences of risk must be taken into account; virtual enterprise cannot risk big for the small. The process of managing business risk consists of the following steps: 1) analysis of input data; 2) quality risk assessment; 3) quantitative risk assessment; 4) the choice of risk optimization tools.

At the first stage, the establishment of possible boundaries and risk zones, the analysis and identification of perceived risks, the determination of practical benefits and possible negative consequences. At the second stage uses statistical methods, analogy methods, analytical methods, expert assessment methods and simulation modeling. At the third stage, risk sharing, its external insurance, diversification, creation of reserves and hedging are carried out. A number of the above actions are carried out by a virtual enterprise, risk sharing is possible through outsourcing, insurance is produced by special organizations.

The following principles should be added to these principles. First, the continuity, according to which investment risk management should be carried out at all the stages of the development and implementation of investment projects and at all stages of the enterprise life cycle. The second, the principle of complexity, implies that investment risk management is consistent with other activities of the enterprise. Third, the principle of formalizing the goal, according to which it is necessary to have clear evaluation criteria for all ongoing activities. Fourth, the principle of optimality, according to which it is necessary to find the optimal ratio between the level of risk and the level of profitability of investments. Fifth, the principle of prioritizing and streamlining risks in order reducing the impact of their entirety.

Since the occurrence of information risk can also be associated with the lack of necessary information or its insufficient volume, also poor quality of information, it is useful to use a scale of empirical estimates to identify the information volume / quality ratio. In addition, it is useful to visualize the results, resorting to either traditional graphic forms or other visualization tools.

Visualization of the state of the enterprise at a particular point in time is a well-known technique and is possible only with the use of information systems. For example, you can display on the monitor screen the status of various units in the form of colored squares, each figure corresponds to a certain period. In the case of a good condition there is a green color of the square, the yellow means the possibility of risk, and the red indicates is the onset of a risk situation. These images allow the head of the company to receive information about the company in real time to take timely measures to prevent or eliminate risk. For virtual enterprises, such visualization is possible both for internal divisions (services), the dynamics of their activities (delivery, payment, delivery of goods to the consumer, information security of hardware and software), and for the external environment - tracking competitors' actions, selling on competitors' sites, common network threats.

2.4. Information security of a virtual enterprise

To ensure information security, a virtual enterprise carries out special activities aimed at preserving information in the process of its receipt, processing and storage. This activity has an organizational and legal basis and relates to economic activity, since it includes the costs of ensuring information security, financial losses in case of its violation, risk assessment and determination of the value of available information for competitors. The loss of information resources or the acquisition of secret information by competitors, as a rule, causes significant damage to the company and may even lead to bankruptcy. The value of information depends on quantitative and temporal indicators, on its confidentiality, availability and integrity. The company's information presented in official reports may also be of value to competitors, since the data of past periods serve as the basis for building future production forecasts.

The solution to the problem of obtaining timely and complete information is in constant control over the operation of the information system, especially with increasing complexity. The control includes the preservation of the data required for the enterprise, duplication of the main indicators, the availability of a spare computer (server) in the event of a system malfunction, updating of antivirus programs and regular checks for computer viruses, use of spare power sources and voltage monitoring in the power grids. In order, the measures to work effectively for information resource protection the security system must meet certain requirements, including continuity, planning, purposefulness, concreteness, reliability and comprehensiveness. Foreign and domestic experience shows that in order to ensure the fulfillment of such multifaceted security requirements, an enterprise information system must have information security tools that satisfy certain conditions: cover the entire technological complex of information activities; have a multi-level structure with a hierarchical access sequence, are open to change, and include options for complementing various information security measures. At the same time, protective equipment must be non-standard, diverse, easy to maintain and user-friendly. Special attention should be paid to the reliability of the system, since any breakdowns of technical means are the cause of the emergence of uncontrolled channels of information leakage. Certain requirements are also placed on the information security system. First, the clarity of the definition of the powers and rights of users to access certain types of information. Second, the minimizing the number of common security features for several users. Third, accounting of cases and attempts of unauthorized access to confidential information. Forth, providing an assessment of the degree of confidential information. Fifth, the ensuring the monitoring of the integrity of protective equipment and immediate response to their failure.

To obtain information about consumers, most enterprises use surveys and observations, as well as internal sources of information and information from open sources (media, the Internet). Marketing decisions of a commercial enterprise based on studies of the processes and trends of the market and consumer surveys in order to determine their relationship to the enterprise, studying the reasons for the

purchase. The company collects data on the degree of satisfaction of consumer needs in goods and services; it monitors the competitors' product, price, sales and communication policies and conducts research based on their publications. The company also makes reviews of commodity reports, monitors the status of inventories, and examines internal reporting on the cost of selling goods. An important activity is advertising in computer networks and studying the effects of advertising on an enterprise.

In recent years, almost all-online stores place information about themselves on social networks, create forums to discuss their activities and form groups of consumers according to their interests. Thus, social networks are becoming a new marketing tool to promote products to the market and study consumer demand, due to the large number of participants, the information obtained becomes statistically reliable and allows you to make the right management decisions on the organization of trade on the Internet.

3. Resource and methodological support for the implementation of the risk management mechanism of virtual enterprises

3.1. Website of a virtual enterprise and its marketing

The main resources for managing the risks of a virtual enterprise are as follows. The first is an enterprise site that allows you to organize all the work on the Internet, and represents the exchange platform and the medium of communication with customers. The second is an enterprise information system that automates business processes. Third, marketing tools, in the first place which is pricing.

An important element of the work of a virtual enterprise is the marketing of its own website - the implementation of actions to maximize the attraction of visitors to the site. Website marketing can be done either by the Internet itself (online marketing) or by specifying the website address in printed materials, on business cards, and so on. (offline marketing). Internet marketing tools are advertising, sales promotion, public relations (PR management), direct sales and direct marketing (interaction with a specific client for the purpose of selling or providing a service). Direct marketing often uses direct address mailing through e-mail of various offers for the client: holding promotions, receiving new products, providing additional services, for example, sending out company magazines. Types of risk and means of reducing it are in Table 3.

Table 3. Risk reduction tools in a virtual trading enterprise competitive strategy.

Kind of risk	Means to reduce the negative effects of risk
Reduced demand	Sales promotion: discounts, preferential terms, advertising on other sites
Competitor actions	Prevention of the possible reaction of competitors to the business and market activity of the enterprise, planning counter-activities in the company's marketing program
Cyclical changes in the economy, the decline in purchasing power of the population	Prediction of cyclical fluctuations in market conditions, their accounting in the marketing and production plans of the enterprise
Partner insolvency	More careful selection of partners, obtaining additional information about them from banking and audit certificates
Cyber attacks	Strengthening the security system, investing heavily in security
Software	Transition to free platforms (Linux), purchase of licensed programs

Working with a customer is the main advantage of Internet marketing, because it allows you to create a database of customers who have made at least one purchase and then reuse the base for further sales. Messages from the seller from whom the product was purchased, the buyer does not perceive as spam (harmful advertising), and treats them with increased attention, which increases the likelihood for the buyer to become a regular customer of the online store.

One of the resources to reduce the business risks of virtual enterprises is pricing. New pricing principles are on the Internet, they allow the virtual entrepreneur, even in a crisis, to implement a flexible pricing policy. The Internet pricing model includes a comparison of market conditions, but it uses the auction model. The principles base on the property of a computer network to propose new technologies for making a profit. They are differ from the pricing of goods and services, which based the costs of their production and distribution. The first principle is “advertising pays for the goods”, it means that by adding advertising revenue to the original price of the goods, you can sell these goods at a price lower than the cost price. The second principle is “the buyer wants to pay” speaks about the constant change in price, which depends on fluctuations in supply and demand and in fact, the Internet constantly works like an auction. The third principle is “price is set depending on the number of transactions” - confirms the dual nature of the Internet as a supplier of free goods and services and the virtual market, since a product or service is provided free of charge, but the buyer pays a certain amount for each financial transaction.

3.2. Virtual market volatility as a tool to reduce risk in the formation of the online store assortment

The standard deviation of a random variable is a measure of risk in many economic and mathematical models, but for a market environment, this indicator does not reflect the real situation. If we consider buyers as investors of a trading virtual enterprise, then it is advisable to measure investment risks at each stage of sales (or at each sale) with an indicator of volatility (a statistical financial indicator characterizing price volatility) operating in the Forex financial market. Volatility is measured in order to track price fluctuations as one of the components of risk.

Volatility has the characteristics of cycles, constancy and the desire for the average and, because it is more predictable than the price, because is in a certain range, this quality of volatility can be used to predict the behavior of an entrepreneur in the market.

If we consider that the Internet works as an auction, price fluctuations for the same goods during the day can be quite high. An online shopper easily tracks prices from different vendors, compares them and chooses the one that best suits them. or corresponding to the criterion of "price-quality". When sales fall, investments in the business of a particular entrepreneur will decrease and the risk of default on the funds of the main investor - the seller will increase. To determine the volatility index, it is necessary to have special software for tracking competitors' actions in the virtual market or the collection of such data is using the marketing service of the virtual enterprise.

Volatility is a measure of the risk of a financial instrument, in the case of analysis of the virtual market - prices. Volatility reflects the speed of price movement, for virtual enterprises, it allows you to adjust the pricing policy and reflects the market saturation with this type of product or group of products. The higher the volatility for this product, the higher the offer, and. therefore, the entrepreneur must either reduce the price or update the range.

The classical calculation of historical volatility involves the comparison of prices over time and the calculation of the ratio of two prices of neighboring periods. For the virtual market, we will calculate in pairs the prices of Internet shops for the same goods, acting according to the following algorithm:

- 1) Building a triangular matrix of pairs of price relations for the goods of the same name (the dimension of the matrix is $(n - 1) \times (n - 1)$, where n is the number of stores selling this product);
- 2) Calculation of the matrix of natural logarithms of the pair relations of prices;
- 3) Calculation of the average value of the logarithms of the pair price relations;
- 4) Calculation of volatility as a quadratic deviation (variance) of the logarithms of pairwise price ratios.

We studied real prices on the Internet for five household appliances goods on seven sites of online stores (Table 4). In store 5, product 4 was absent. For each product, tragedy matrices of paired price ratios built (Table 5).

Table 4. Prices for household appliances in virtual stores in conventional money units.

Price	Store 1	Store 2	Store 3	Store 4	Store 5	Store 6	Store 7
Product 1	6099	5545	5859	5545	5329	5799	6985
Product 2	4549	3754	4199	3754	3803	3746	4073
Product 3	1379	1159	1165	1269	1299	1165	1166
Product 4	4359	4299	4299	4299	-	4299	4589
Product 5	5200	5399	5399	5399	5499	5399	6791

Table 5. Matrix of pairwise price relationships for product 1.

Price	6099	5545	5859	5545	5329	5799	6985
6099	X	0,909	0,961	0,909	0,874	0,951	1,145
5545	1,000	X	1,057	1,000	0,961	1,046	1,260
5859	1,000	1,000	X	0,946	0,910	0,990	1,192
5545	1,000	1,000	1,000	X	0,961	1,046	1,260
5329	1,000	1,000	1,000	1,000	X	1,088	1,311
5799	1,000	1,000	1,000	1,000	1,000	X	1,205

According to the algorithm for calculating volatility, we construct a matrix containing logarithms of the calculated ratios (Table 6).

Table 6. Matrix of natural logarithms of pairwise price relations for product 1.

Price	6099	5545	5859	5545	5329	5799	6985
6099	X	-0,095	-0,040	-0,095	-0,135	-0,050	0,136
5545	0	X	0,055	0,000	-0,040	0,045	0,231
5859	0	0	X	-0,055	-0,095	-0,010	0,176
5545	0	0	0	X	-0,040	0,045	0,231
5329	0	0	0	0	X	0,085	0,271
5799	0	0	0	0	0	X	0,186

We calculate the arithmetic average value M (Formula 1) for all elements of this matrix A (Table 5).

$$M = \frac{n(n-1)}{2} \sum_{i=1}^{n-1} \sum_{j=i+1}^n a_{ij} \tag{1}$$

We build the matrix B of the squares of the differences of the average and the elements of the transformed matrix A from table 5 (Table 7).

Table 7. Matrix B (squares of differences of the average and logarithms of the price relation for product 1).

Price	6099	5545	5859	5545	5329	5799	6985
6099	X	0,018	0,006	0,018	0,030	0,008	0,009
5545	0	X	0,000	0,001	0,006	0,000	0,037
5859	0	0	X	0,009	0,018	0,002	0,019
5545	0	0	0	X	0,006	0,000	0,037
5329	0	0	0	0	X	0,002	0,054
5799	0	0	0	0	0	X	0,022

Based on the matrix A we calculate the volatility V for product 1 using the formula 2, $V=0,014$.

$$V = \frac{n(n-1)}{2} \sum_{i=1}^{n-1} \sum_{j=i+1}^n b_{ij} \tag{2}$$

For each product, we apply an algorithm for calculating volatility and find that the minimum value $V=0,001$ for product 4, it means the possibility of further sales of this product at a specified price. The maximum value for product 1 ($V=0,014$) means that virtual market is saturated with this product and for successful sales it is necessary to reduce the price.

In the proposed approach, volatility acts as a measure of price change not in time, as in the traditional sense, but as a price gradient and an indicator of the price risk of a virtual enterprise in the virtual Internet space.

Using the methods and pricing models, as well as calculating volatility as an assessment of the price gradient of a particular virtual entrepreneur, can form its own pricing policy and thereby avoid or minimize price risks. Also, in order to reduce price risk, it is recommended to organize a permanent system of advanced training for personnel involved in the development of pricing policies; develop technologies and procedures for making effective pricing decisions; to develop a system for adjusting the level of trade margin and selling price.

3.3. Threats at various stages of online shopping

The continuous development of network technologies in the absence of continuous security analysis leads to the fact that over time the network security decreases. New unaccounted threats and system vulnerabilities appear.

Consider what threats lie in wait for a firm at different stages of making a purchase via the Internet (Table 8).

Table 8. Possible threats at various stages of making a purchase via the Internet.

Actions of the customer or company	Possible threat
The customer chooses a product or service through an online store server and places an order.	Substitution of the e-store web page. The main implementation method is to redirect user requests to another server. It is performed by replacing entries in the tables of DNS servers or in the tables of routers.
The order is recorded in the store orders database.	Penetration into the database and changes in the order processing procedures make it illegal to manipulate the database.
The availability of a product or service is checked through a central database. If the product is not available, the cus-	Implementing denial of service attacks and disrupting or disabling an e-commerce site.

<p>customer receives a notification about this. Depending on the type of store, a request for a product may be redirected to another warehouse.</p> <p>If a product or service is available, the customer confirms the payment and the order is placed in the database.</p> <p>The e-shop sends an order confirmation to the customer.</p> <p>Customer on-line pays for the order.</p>	<p>Creation of false orders from the staff of the electronic store.</p> <p>Interception of data transmitted in the e-commerce system.</p> <p>A particular danger is the interception of customer's credit card information.</p>
<p>The goods are delivered to the customer.</p>	<p>Fraud by e-store employees.</p>

There is a concept - adaptive network security. It allows you to provide protection in real time, adapting to the constant changes in the information infrastructure. It consists of three main elements - security analysis technology, attack detection technology, risk management technology. Security analysis technologies are an effective method to analyze and implement network security policies. Security analysis systems search for vulnerabilities, but by increasing the number of checks and examining all its levels.

Any software has certain vulnerabilities that lead to the implementation of attacks. Vulnerabilities of e-Commerce system design (for example, lack of protection), and implementation and configuration vulnerabilities. The last two types of vulnerabilities are the most common and are found in any organization. All this can lead to the implementation of various kinds of attacks aimed.

3.4. Adaptation to risks and their reduction resources

The environment of virtual enterprises consists of the Internet and traditional economic and state institutions, which form an unstable system and generate risks.

The resources of the external environment that reduce the occurrence of risks include: - reduced inflation; improvement of the tax system; reducing corruption and the level of the shadow economy; pursuing a flexible monitoring and credit policy; increase in incomes of wide strata of the population, which will lead to a corresponding increased solvency and attraction of investments in the economy.

The mechanism of enterprise adaptation to risk consists of socio-psychological and organizational-economic parts. Socio-psychological include adaptation to the risk of the subject making management decisions, organizational and economic are designed to control the level of risk, manage their own capital in order to prevent the risk of bankruptcy, striving for a sustainable economic condition of the enterprise.

The risk adaptation mechanism performs informational, warning and compensating functions. The information function is related to ensuring the economic security of the enterprise, identifying potential situations of risk occurrence, obtaining sets of characteristics and risk signals. Enterprise managers view economic security and it is not as a set of hierarchical tasks of managing performance, but as a single holistic process, which allows including all the mechanisms of risk adaptation at any stage of production. The smaller the completeness and accuracy of information at the time of making a management decision, the higher the risk of economic security breach. The warning function of the adaptation mechanism to risk is aimed at increasing economic security when making an erroneous decision, reacting to possible negative consequences of the activity of a management entity. The compensating function provides the ability to neutralize or compensate for the possible negative results of various actions in achieving goals.

The resources of the external environment to prevent the risks of virtual enterprises are also common for them and small businesses the following resources: sufficient financial and credit support;

more perfection tax system; favorable investment conditions; lack of administrative pressure on small businesses; knowledge of entrepreneurs in the conduct of economic activity; soft government regulation of virtual entrepreneurship.

Sophisticated systems have temporary memory that allows them to use the experience of previous risks and find solutions for new problems based on previously created situational patterns.

The resources for reducing the organizational and production data of the risks of a virtual enterprise include follow components. First, right chosen strategy. Second, rational and efficient allocation of resources. Third, reduction of production costs and thoughtful innovations. Forth, the coordination of actions of all divisions of the virtual enterprise and making right management decisions based on computer analysis of internal and information coming from the Internet. Fifth, the duplication of a database of customers and products on the server and a spare computer, as well as other databases of the virtual enterprise, necessary for the operation of the virtual enterprise.

Resources for reducing commercial risks are the presence of its own niche in the market; proper use of available information; the use of modern marketing tools, including the Internet; the use of special systems and pricing methods on the Internet.

These resources and methods will allow increase the volumes of sales of a virtual enterprise and increase its profits.

4. Conclusion

Since the virtual enterprise is innovative in its essence, the minimization of the risks of innovation activity occurs constantly. For information protection, it is necessary to create a daily history of the work of the enterprise with further analysis of the adjustment of strategy and tactics; duplicate commercial information; track information flows from the enterprise to the consumer and back. To minimize organizational and economic risks, continuous monitoring of all forms of reporting and presentation of analysis results in tabular and graphical forms is necessary.

Analysis of the resource and methodological support of the implementation of the risk management mechanism of a virtual enterprise allows developing the following practical recommendations.

The means of reducing the negative consequences of risk are enhancing sales, planning responses to possible actions of competitors, more careful selection of partners and strengthening the security system. The methods of risk management include pricing methods on the Internet, assessment of price volatility for a particular product, content generation based on risk assessment for individual properties of economic information; risk management of cyber-attacks based on their probabilistic assessment.

The resources of the external environment that reduce the appearance of risks are the reduction of inflation, the increase in household incomes, and the pursuit of a flexible economic policy of the state, including financial and credit support for virtual entrepreneurship. The internal resources for risk reduction include a correctly chosen strategy of a virtual enterprise, reduction of production costs, continuous innovation, pricing policies of a virtual enterprise, duplication of information, creation of various databases.

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